

REMARKS

By the present Amendment, Applicant has amended Claims 1, 12, and 17. Claims 1-32 are pending in the application. Claims 1, 9, 10, 11, 12, 17, and 25 are independent claims.

The Office Action has been carefully reviewed, and these amendments and arguments are made in a genuine effort to bring the application into condition for allowance. Reconsideration of the rejection of Claim 1-8, and allowance of Claims 1-8, 12-24, and 27-32 is respectfully requested in light of these amendments and arguments.

The Present Invention

The present invention provides an air or gas-powered gun providing a recoil that is enhanced over that of a typical air or gas-powered gun, and is similar to that of a firearm or gun firing a powder propelled projectile. The level of recoil generated is therefore significantly more than would normally be provided through the equal and opposite reaction to the action of the discharge of a pellet. This feature provides a gas-powered gun that may be utilized as a training alternative to an actual firearm, that may be used safely in a wider variety of locations and training exercises than an actual firearm, and that is significantly less expensive to shoot than an actual firearm.

The Cited Art

U.S. Patent No. 4,116,193 (Chiba) describes a manually operated, pressurized gas gun. This air gun includes a tubular magazine having a spring-biased follower, with the front of the magazine being positioned against a horizontally moving carrier. The carrier defines a hole for receiving a single pellet, and reciprocates between a position wherein the hole is aligned with the magazine, and a second position wherein the hole is aligned with the bore. A bolt reciprocates between a rearward position permitting horizontal movement of the carrier, and a forward position wherein a pellet picked up by the carrier and aligned with the bore has been pushed forward ahead of the bolt into a chamber. Movement of the bolt and carrier are controlled by a reciprocating operating handle in the form of a fore stock. Air from a gas cartridge is permitted to enter a valve chamber until air pressure within the valve chamber is sufficient to overcome the force of the spring holding the valve chamber open, at which point the air pressure closes the valve chamber. When the trigger is pulled, the

trigger movement causes a sear to release a hammer, striking the rear portion of a valve rod, opening the valve and permitting the gas therein to expand behind the pellet in the chamber, driving the pellet out of the barrel. Once the pellet is discharged from the barrel, it is necessary to cycle the operating handle to chamber the next pellet from the magazine. As the Examiner correctly notes, every action has an equal and opposite reaction, which would cause the air gun of Chiba to exhibit a very small, virtually imperceptible recoil. There is no mechanism whatsoever disclosed within Chiba for increasing the small, virtually imperceptible recoil up to the substantially larger level of recoil exhibited by a powder propelled firearm.

U.S. Patent No. 4,819,609 (Tippmann) discloses a valve assembly and a firing mechanism including a spring-biased bolt. The bolt is held in its rearward position, against the spring pressure, by the trigger mechanism. The valve assembly includes a tubular valve housing having a valve at each end, with the valves being spring-biased away from each other and towards each end of the valve housing, so that the spring pressure biases each valve against the valve housing, closing the valve. Both the valve housing and the rear valve are reciprocable between a forward and a rearward position. When the trigger is pulled and both released, the bolt travels forward to strike the valve assembly, causing both the rear valve and tubular housing to move forward, thereby opening both the forward and the rear valves within the assembly. Compressed gas escaping through the forward valve pushes the projectile out the barrel. Compressed gas escaping through the rear valve pushes the bolt back to its original position against the forward bias of the bolt spring. A selector switch moves the sear pivot pin between three positions: a safe position, wherein the trigger cannot reach the sear to trip it; a semi-automatic position, wherein the trigger may trip the sear, but the sear slips past the end of the trigger when the trigger is fully retracted; and full automatic, wherein the trigger holds the sear out of engagement with the bolt for the duration of the trigger pull. As the Examiner correctly notes, the action of discharging a paint pellet from the paint ball gun of Tippmann would create an equal and opposite reaction. Tippman does not disclose any means for increasing this barely perceptible reaction to the action of firing a pellet to the substantially greater level of recoil generated by a powder propelled firearm, or even the desirability of doing so.

Allowable Subject Matter

The Examiner has indicated that Claims 9-11, and 25-26, are allowed.

The Examiner indicated that Claims 12-24 and 27-32 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form, including all of the limitations of the base claim and any intervening claims. Applicant has therefore rewritten Claims 12 and 17, originally dependent from Claim 1, in independent form, and including all limitations of Claim 1. Claims 13-16 are all directly or indirectly dependent from Claim 12. Claims 18-24 and 27-32 are all directly or indirectly dependent from Claim 17. All of these claims are now submitted to be in condition for allowance.

Rejection of Claim 1 Under 35 U.S.C. § 102

The Examiner rejected Claim 1 under 35 U.S.C. § 102(b) as being anticipated by Tippman. Claim 1 was also rejected under 35 U.S.C. § 102(b) as being anticipated by Chiba. The Examiner asserted that both Tippman and Chiba disclose a gas-powered gun comprising a means for simulating a recoil approximating a recoil generated by a gun firing a powder-propelled projectile. The Examiner further asserted that all guns approximate a recoil based on Newton's Third Law. Applicant respectfully submits that these assertions are contradictory. Tippman and Chiba both exhibit a recoil from the action of dispelling a projectile at a high velocity in one direction, resulting in momentum of the gun in the other direction. However, such recoil would be completely imperceptible to a shooter. This recoil will not come anywhere near approaching the recoil generated by a gun firing powder-propelled projectile. It is well known in the art of firearms that a powder-propelled projectile is usually heavier than the typical projectile from a gas-powered gun, and will always travel at a significantly higher velocity. Therefore the action of discharging a powder-propelled projectile will generate a substantially greater recoil which will certainly be perceptible by - and in some cases uncomfortable for - the shooter. This recoil, when generated in a gas-powered gun, is significantly greater than the recoil generated due to Newton's Third Law.

Although it is possible that Tippman generates some additional recoil due to the reciprocating bolt, there is no teaching or suggestion whatsoever within Tippman that this recoil is desirable, or that this recoil is perceptible by the shooter.

Furthermore, there is no teaching or suggestion within Tippman to use a mass within the bolt or bolt driver to increase this level of recoil. In fact, the paintball gun disclosed by Tippman is specifically intended to discharge paintballs at a sufficiently low velocity so that they may be safely discharged towards another person. Therefore, the pressures within Tippman would need to be kept sufficiently low so that neither the recoil generated by Newton's Third Law, nor the recoil generated by the reciprocating mass of the bolt, would be anything near that generated by a powder-propelled projectile.

Claim 1, as amended, recites a gas-powered gun having means for simulating a recoil that is enhanced to approximate a recoil generated by a gun firing a powder-propelled projectile, thereby clarifying that the recoil is enhanced above that which would be generated by Newton's Third Law or by incidental reciprocation of the bolt, and that the recoil approximates the recoil generated by a gun firing a powder-propelled projectile. Again, Applicant respectfully submits that one skilled in the art of firearms would understand that a gun firing a powder-propelled projectile will generate substantially more recoil than a gun firing a gas-powered projectile, and that Claim 1 therefore does not read on Tippman or Chiba.

Because neither Tippman nor Chiba teach or suggest any means for enhancing the recoil of a gas-powered gun, or any means for generating a recoil approximating a recoil generated by a gun firing a powder-propelled projectile, Claim 1, and all claims dependent therefrom, are respectfully submitted to be in condition for allowance.

Rejection of Claims 2-5, and 7-8 Under 35 U.S.C. § 102

The Examiner rejected Claims 2-5 and 7-8 under 35 U.S.C. § 102(b) as being anticipated by Tippman.

Claim 2 is dependent from Claim 1, and therefore includes the limitation that a gas-powered gun comprises a means for simulating a recoil that is enhanced to approximate a recoil generated by a gun firing a powder-propelled projectile. As explained above, any recoil used by Tippman is the incidental result of Newton's Third Law, and the likewise incidental result of the reciprocating bolt mass. There is no teaching or suggestion within Tippman to enhance the recoil of a gas-powered gun to approximate the substantially heavier recoil generated by a gun firing a powder-propelled projectile.

Furthermore, Claim 5 recites that the spring, forward valve, and rear valve form a captive assembly. A captive assembly provides the advantage of ease of repair and replacement, and is neither taught nor suggested by Tippman.

Claims 7 and 8 are both directed towards a buffer assembly. Claim 7 recites that the buffer assembly biases the bolt towards its forward position, and provides a recoil for the shooter. Claim 8 further recites that the buffer assembly includes a spring-biased air-resistant bolt driver. Use of both the bolt and the buffer assembly to provide recoil to a shooter permits the level of recoil to be varied to simulate the many different levels of recoil generated by a wide variety of powder-propelled firearms. For example, by using the air-resistance bolt driver recited in Claim 8, the recoil of a small caliber powder-propelled projectile, for example, the 5.56 mm cartridge of the AR-15 and M-16 rifles. Therefore, Claims 2-5 and 7-8 are submitted to be in condition for allowance.

Rejection of Claim 6 Under 35 U.S.C. § 103

Claim 6 was rejected under 35 U.S.C. § 103(a) as being obvious in light of Tippman in view of ordinary skill in the art. The Examiner asserts that there is no disclosed criticality of the floating mass. Applicant respectfully disagrees.

As explained on page 18, lines 8-13, the floating mass within the bolt provides a means of varying the cyclic rate of full automatic fire by slowing forward bolt travel sufficiently so that the sear may momentarily fetch and delay forward movement of the bolt. Furthermore, page 8, lines 2-6, explain that it is the reciprocating mass that supplies a recoil to a shooter. The reciprocating mass includes both the reciprocating bolt with the mass therein, and the reciprocating bolt driver.

It is therefore submitted that Claim 6 is in condition for allowance.

CONCLUSION

For the above reasons, it is respectfully submitted that Claims 1-8, 12-24, and 27-32 are now in condition for allowance. If such is not the case, the Examiner is invited to telephone Applicant's representative so that any additional issues may be resolved.

Respectfully submitted,

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